Claims

1. A rotation angle detection device comprising:

a stator provided with a one-phase excitation winding and two-phase output windings; and

a rotor having salient poles,

characterized in that the two-phase output windings are wound around a plurality of teeth of the stator, and

respective numbers of turns of the two-phase output windings are obtained by using m-phase windings (m is an integer of 3 or more) defined in advance to convert the numbers of turns of the m-phase windings into those of two-phase windings.

2. A rotation angle detection device according to claim 1,

characterized in that, when the numbers of turns of the m-phase windings (m is an integer of 3 or more) are converted into those of two-phase windings, the conversion is performed according to the following expression:

$$N_{\alpha i} = k\sum_{n=1}^{m} N_{ni}\cos(\gamma + \frac{2(n-1)}{m}\pi)$$
$$N_{\beta i} = k\sum_{n=1}^{m} N_{ni}\sin(\gamma + \frac{2(n-1)}{m}\pi)$$

(γ represents an arbitrary constant, k represents an arbitrary constant excluding zero, a subscript i represents a number of a

tooth, α and β represent two-phase windings after conversion, and n represents nth phase before conversion. In other words, $N_{\alpha i}$ and $N_{\beta i}$ represent the number of turns of the α-phase and β-phase windings in the ith tooth, respectively, and N_{ni} represents the number of turns of nth phase winding of the ith tooth.)

3. A rotation angle detection device according to claim 1 or 2,

characterized in that the number of teeth of the stator is assumed to be 3n (n is a natural number).

4. A rotation angle detection device according to claim 1 or 2,

characterized in that, in the case in which the number of teeth of the stator is an odd number, a winding pattern of the excitation winding is a pattern repeated by the number of times of a number which is the same as a value of a divisor of the number of teeth.

5. A rotation angle detection device according to claim 3 or 4,

characterized in that the number of teeth of the stator is nine, and a shaft multiple angle is 4 or 8.

6. A rotation angle detection device according to claim 3,

characterized in that the number of teeth of the stator is twelve, and a shaft multiple angle is 4 or 8.

7. A rotation angle detection device according to any one of claims 1 to 6,

characterized in that the numbers of turns of the two-phase output windings are adjusted such that the two-phase output windings do not pickup a magnetic flux of a spatial order which is the same as a spatial order of a change in permeance of the rotor or a magnetic flux of a spatial 0^{th} order.

8. A rotation angle detection device according to any one of claims 1 to 7,

characterized in that the numbers of turns of the two-phase output windings are adjusted such that the two-phase output windings do not pick up a specific component of a gap magnetic flux which is generated when a rotation shaft of the rotor and a center of the stator deviate from each other or when a center and the rotation shaft of the rotor deviate from each other.

9. A dynamo-electric machine, characterized by comprising the rotation angle detection device according to any one of claims 1 to 8.